Does regional integration within developing countries really diverge? The Southern Africa Development Community experience on the period 1995-2019

Abstract

This paper tests the real convergence within Southern Africa Development Community (SADC). Given that economic theory suggests that economic integration within developing countries gives rise to regional divergence, the main aim of this study is, thus, to verify whether this theory is valid for the SADC. To test this premise, we analyse real per capita income dispersion within the region and proceed to the estimation of a β-convergence model on a sample of eleven countries of the region on the period 1995-2019. Our results are irrevocable: there is no proof of catch-up within this zone during this period. This shows that the gains and costs of the integration are unequally shared among members states.

Key words: Economic integration, Real convergence, SADC.

1. Introduction

The worldwide trade liberalisation, termed "first best policy", goes along everywhere with a deep interest for regionalism. Therefore, a multiplication of FTA is observable all around the world and all countries, except Mongolia, are involved in at least a regional economic agreement. Accordingly, 462 regional economic agreements have been declared at GATT/WTO until 2010 and about 40% of international trade is carried on within the framework of preferential agreements (Beitone and al, 2010).

Africa is no exception to this evolution. So, according to UNCTAD (2010), there are fourteen regional groupings on this continent such as the East Africa Community or the Central Africa Monetary and Economic Community. The African countries have signed 54 preferential trade agreements of which 43 concern South-South cooperation (De Melo and al, 2014). However, these regional blocks pose with persistence the problem of their overlapping, since some countries are members of many regional blocks often with divergent aims. Considering the Southern Africa case, at least four grouping are reckoned among which Southern Africa Development Community (SADC), the Southern Africa Custom Union (SACU), the Rand zone or still the Common Market of Eastern and Southern Africa (COMESA).

The economic theory argues that trade liberalisation, and economic integration, could be a factor of economic growth. Indeed, thanks to its expanded market, regional integration offers

opportunity for the economies of scale and stresses competition. In addition, it allows the technology transfer, especially in the framework of North-South integration.

However, South-South integration could lead to a regional divergence. Indeed, owing to comparative advantages superior to the regional average, the more advanced countries of the region will concentrate industrial activities. Likely there is going to be trade creation for those economies and trade diversion for the others (Venables, 2000, 2001; Henner, 2001).

Thus, this paper is an empirical check the impact of regional integration policies within developing countries on their convergence. We did not choose the SADC by chance. Anyway, it is one of the most integrated regions in Africa and records the highest level of intra-regional trade with approximately 22% of the total trade (UNCTAD, 2010). Besides, the region also draws "important" flows of FDI, about forty per cent of global FDI of the continent. Finally, the SADC is a South-South agreement with a leading economy, namely South Africa. Its presence in the union could be favourable for economic growth of the other countries.

The rest of this paper is organized around two parts. The first deals with the theoretical framework of real convergence in a context of regional integration while the second presents the empirical analysis and some comments.

2- The theoretical framework

We shall open this part with a brief presentation of the concept of economic convergence. The second hall will be dedicated to the theoretical inspirations of this study.

2.1-Notions linked to the economic convergence

The concept of convergence is used in economic analysis to characterise the catch-up process of economies with regard to some macroeconomic variables. Indeed, for economists, the problem of convergence arises when we analyse the long run growth process of economies. In the case of regional integration, heterogeneous economic or financial performances or structures can cause rigidities in the conduct of the integration process and can create undesirable differences in the share of benefits and losses of integration between member states.

Economic convergence can take two forms which are "nominal convergence" and "real convergence". The first refers to the catch-up process of some nominal variables of macroeconomic stability such as inflation rate or the public deficit. As for real convergence, it

has to do with the relative improvement of the living standard among a group of countries. It establishes among them a homogenisation of living conditions which creates a "social and economic cohesion". In practice, it means the reduction of per capita income dispersion within the concerned economies. Thus, real convergence is the consequence of the integration process.

Barro (1991) links the realisation of real convergence to factors such technological similarities and human capital. This leads him to negative predictions for developing countries. According to him, due to technological and human capital gaps, the third world won't be able to catch-up with the developed world.

Sachs and Warner (1995) propose a different analysis from Barro's (1991). According to them, an economic growth leading to convergence is determined by more indispensable factors than a productive technology. First and foremost, it requires efficient institutions. Therefore, countries with human rights abuses, tight protectionist commercial policies or inconvertible currencies cannot converge whatever their technological performances and their level of their human capital. Hence, restrictive international trade policies are very harmful to convergence because they distort economic incentives and disconnect the country from international flows of knowledge.

2.2- *Measures of economic convergence*

To study economic convergence, two complementary concepts are used: β-convergence and **σ**-convergence. We reckon β-convergence in a region if the poor member economies tend to grow faster than the more advanced ones. Let us assume that there is convergence within a set of countries. To capture it, we estimate the following model:

$$\log Y_{it} = a + \beta \log Y_{it-1} + \varepsilon_{it} \qquad (1)$$

The condition $\beta < 0$ translates the β-convergence.

Concerning the **σ**-convergence, it refers to the mechanism of deviation reduction between two countries or regions. The statistic observation of temporal evolution of a dispersion indicator is sufficient to study convergence. The most popular dispersion indicator is the standard deviation. For the logarithm of GDP, its expression is:

$$\sigma_i^2 = 1/N \sum_{i=1}^{N} (LogY_{it} - \mu_i)^2 \qquad (2)$$

With μ is the mean of the data $LogY_{it}$. The catch-up process means this indicator decreases in time.

2.3- Theoretical inspirations of the study

The international trade theories have immediate implication concerning the debate on the relation between regional integration and real convergence. This relation is better perceived when it is applied to the analysis of real salaries. Heckscher-Ohlin paradigm stipulates that countries export goods using intensively the abundant factor of production and import the other goods. Disregarding transportation costs, liberalisation tends to level the prices of exchangeable goods. Therefore, countries effectively export products that use the abundant factor and which are relatively cheap. The demand for that factor will increase while the demand for the rare and expensive factor will drop. Thus, the convergence of prices of products tends to induce convergence of prices of factors. In the outskirts with abundant labour offers, the real salary tends to be lower than in the centre where the labour force is scarce. Work tends to move from the outskirts toward the centre in search of higher salaries. This move increases salaries in the outskirts and causes the salaries of the centre to drop. In the same way, there shall be the move of capital from centre to the outskirt in search for higher productivity. Those different movements tend to break down the disparities of prices of factors between regions (Mundell, 1957).

All these arguments from traditional trade theories have implications in the debate on convergence which highlights the convergence properties of aggregates such as the per capita GDP. So, with Y the GDP, P the level of prices, v_i the dotation of the factor i (i=L, W) and ω_i the price of factor i ($\omega_1 = W, the\ salary$). The definition of the GDP including costs of factors implies that:

$$\frac{Y}{i} = (\frac{w}{P})\lfloor 1 + \sum_{i \neq L} W_i V_i / WLVL \rfloor \qquad (1)$$

It appears then that the convergence of the GDP per capita rests on three forces. To start with, there is the convergence of relative per capita factorial dotations (W_i /V_i). Solow's (1956) model stresses this mechanism. However, phenomena as migrations and international mobility of the capital can yield similar results (O'Rourke, 1999). Next, there is the convergence of relative prices factors (W_i/W_1), which, once more, can be a consequence of Solow's accumulation forces. It can also result from the opened economies forces of the Ohlin-Heckscher type. The third force is the convergence of salaries which can be linked to openness or to the integration of markets of goods and factors.

It arises from the preceding analyses that traditional international trade theories forecast a strong relation between regional integration and convergence, whether the latter is expressed in terms of costs of factors or in terms of aggregates.

However, the pattern described by the New Geographical Economy is much less optimistic than the previous one. According to them, regionalism triggers a re-allocation of economic activities within the grouping. Industries spread in some countries and shrink in others. This leads to changes of the labour demand forces and of the revenue levels. To know how those industries are redistributed within the region, it matters to investigate the outlines of the comparative advantages of member states, first among themselves, then in relation to the rest of the world. The general idea that emerges from the analyses of these theories is that within a region, the economies whose comparative advantages profile is closer to the world mean are more likely to benefit from the redistribution of activities than those economies with extreme profiles (World Bank, 2000; Venables, 2000; Henner, 2001).

In principle, the existence of transport cost and differences in comparative advantages between states necessarily leads to unbalanced growth based on differences of income demand resilience. An economy with a comparative advantage in the production of some particular goods and with a great income resilience should see its potential growth increase mechanically provided that national and regional institutions do not hinder the market expansion for its firms (Henner, 2001). In such a situation, there is a risk of growth concentration in one ore some member states. There is, thus, a persistent divergence within the region.

The following table summarizes the main results of the literature.

Table 1: Theoretical controversy about the impact of regional integration on real convergence

Regional integration is favourable to convergence	**Regional integration is not favourable to convergence**
Mundell (1957): factors mobility favour convergence	Venables (2000): economies whose comparative advantages profile is closer to the world mean are more likely to benefit from the integration
O'Rourke (1999): International migration tend to international convergence	Henner (2001): there is a risk of growth concentration in some member states.

Source: Authors

However, Venables (2000) rightly noticed that the integration between developing economies does not necessarily lead to a divergence vicious circle. Indeed, if there is a relatively more advanced economy within that union, it might play the leading role, and thus be the convergence drive within the region.

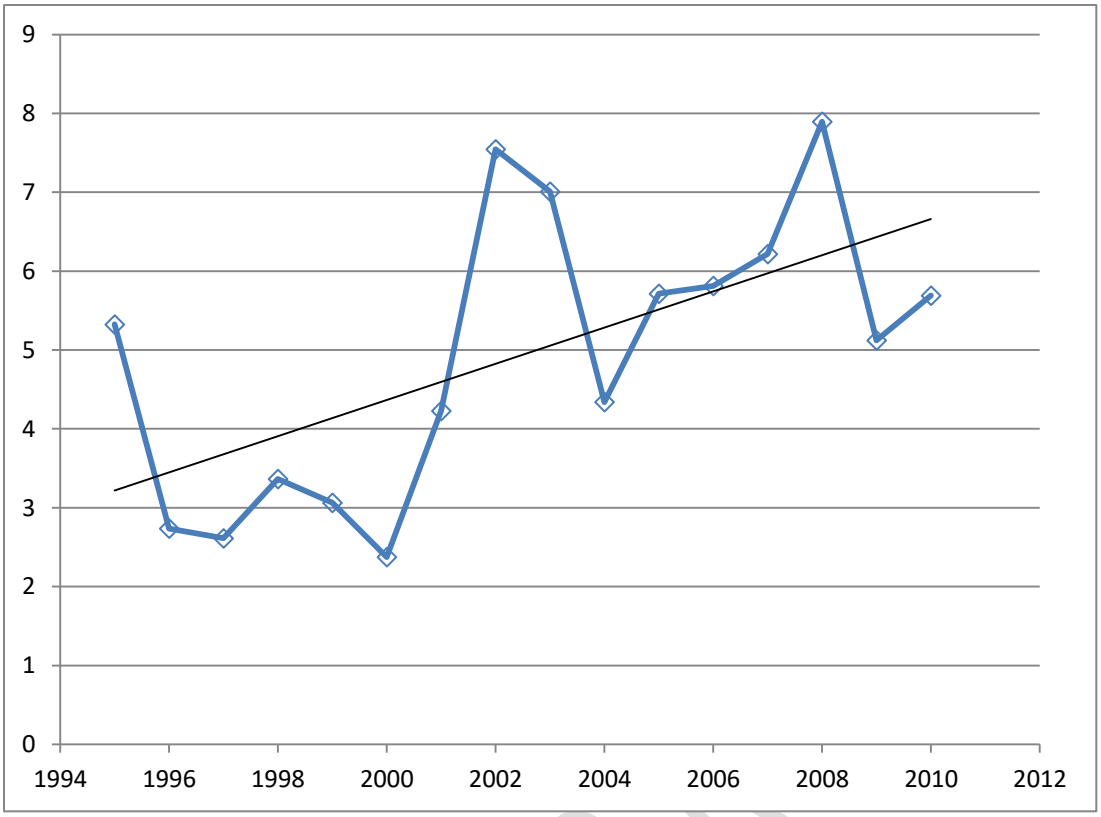
3- METHODOLOGY

Our sample is formed of eleven countries of the SADC according to the availability of data, including South Africa. The period considered is 1995-2019. The countries of the sample are: Angola, Botswana, Dem. Rep. of Congo, Lesotho, Madagascar, Malawi, Namibia, Seychelles, Tanzania, South Africa and Zimbabwe. We collect data from the World Bank (World Development Indicators, 2020) for GDP, openness, government expenditures and investments; and from the UNCTAD for FDI. We shall begin by analysing the standard deviation of growth rates and per capita incomes. Then after, we shall look for the β-convergence.

The σ-convergence test within SADC

The SADC is formed of heterogeneous economies with regard to their levels of development. Some score a rather sustained rhythm of growth while others slightly ever expand. This situation has immediate consequences on the catch-up process. As shown by the following graph, between 1995 and 2000, the standard deviation of growth rates in the SADC has decreased. One explanation could be the conjuncture of the entire region, characterised by weak growth rates. Between 2000 and 2002, it grew. It decreased between 2002 and 2004. It grew again before 2008. Globally, the standard deviation of the growth rate has an upward trend. In fact, the standard deviation of regional growth rates grew by 5 percentage points between 1996 and 2008. It could be explained by the fact that, despite the moderate growth of South Africa, some countries expanded by more than 10%.

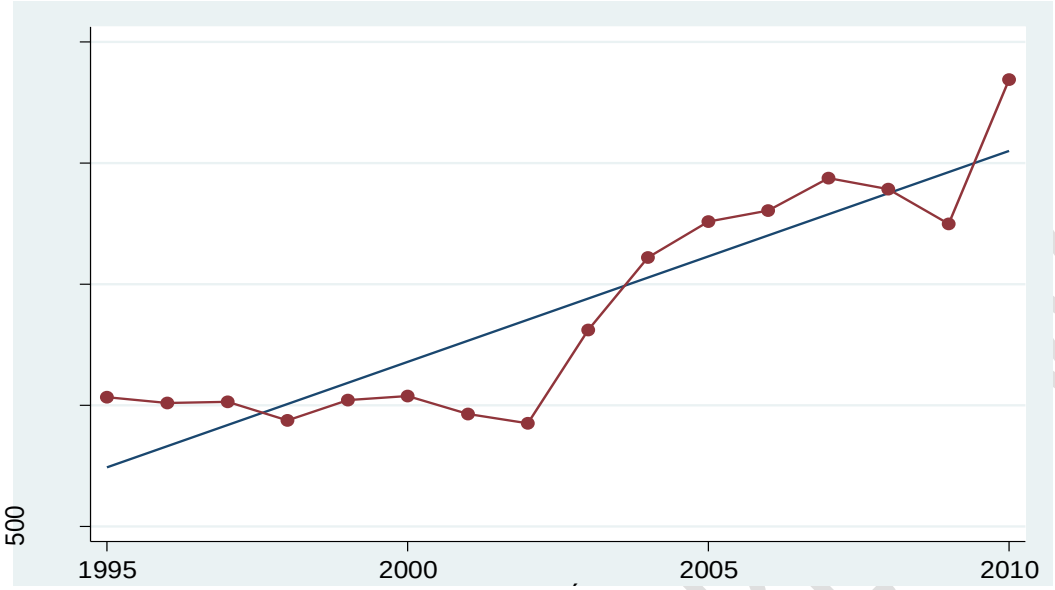
fig.1 standard deviation of growth rates in the SADC



Source: Authors with data from the World Bank

Let us now analyse the temporal dispersion of the per capita GDP. The next graph represents the evolution of the standard deviation of the per capita GDP in the region, excluding South Africa. This indicator permits the analysis of the dynamics of the economies of the region, in their catch-up process on South Africa. There isn't any proof of a reduction of this indicator concerning the income. The standard deviation has increased in time. This indicator enables us to predict the existence of one or at least two convergence clubs in the region. However, this dispersion evolved diversely in the course of time. Between 1995 and 2002, there was a weak decrease of the deviation. This trend reversed from 2002 with the explosion of the indicator until it neared $ 2000 in 2007. There was a weak decrease in 2008 and 2009. From 2009 it started to increase once more.

Fig.2 : Income dispersion in the SADC



Source: Authors with data from the World Bank

In fact, the income dispersion in the SADC increased in the period. Since there is a divergence of this indicator, we predict the existence of at least two convergence clubs in the SADC.

As shown by Quah (1996) and Sala-i-Martin (1996), the absence of **σ**-convergence does not mean the absence of β-convergence. Since we have not had any proof of **σ**-convergence in the SADC, we will now try to check for β-convergence.

The econometric model

Assuming that South Africa is the leading economy of the SADC, our analysis consists in the study of the spread of the income per capita between South Africa and the others. Our main variable is therefore the difference between the gross domestic products of each country (in logarithm) and the South Africa GDP. So, the general form of our estimated model is:

$$LogY_{it} - LogY_{st} = a + \beta(LogY_{it} - LogY_{st-1}) + \varphi X_{it} + a_i + \lambda_t + \varepsilon_{it} \qquad (3)$$

In this equation, Y_i represents the per capita GDP and Ys the South Africa per capita GDP. The matrix X contains a set of exogenous variables which capture national or regional policies. Some variables founded in the matrix X are: FDI (in proportion of the GDP), HIV prevalence as a proxy of human capital, Government expenditures (in proportion of the GDP), openness and investment (in proportion of GDP). The catch-up process will be started if $\beta<0$.

Given that in the Southern Africa there is a monetary union, the Rand Zone, formed by five countries of the SADC; it would be interesting to check whether the monetary union has any effect on the catch-up process within SADC. More specifically, member states of that monetary union are expected to converge faster than the other. We will test this hypothesis with a modified form of the equation 3. We will try to see if there exists specificity for the Rand Zone countries. The equation 3 will be modified as follow:

$$LogY_{it} - LogY_{st} = a.MU + \beta(LogY_{it} - LogY_{st-1}) + \varphi X_{it} + a_0 + \lambda_t + \varepsilon_{it} \qquad (4)$$

MU is a binary variable taking 1 if the considered country is a member of the Rand Zone and 0 if not. In this equation, we expect the coefficient of this variable to be positive. This means we expect the monetary union to have a negative impact on the catch-up process within the SADC member states.

Estimation method

Traditionally, fixed and random effects estimators are used to estimate models on panel data. However, these estimators have proven to be inappropriate when there is an endogeneity bias. Thus, to take this risk into account, the Dynamic General Moment Method has been developed to overcome the shortcomings of traditional estimators (FE, RE). Overall, there are two main advantages to using the dynamic GMM method. First of all, this method makes it possible to consider the temporal dynamics (that is to say, models in which the explanatory variable lags are among the exogenous variables). The second advantage is that this estimation technique allows us to treat all exogenous variables as potentially endogenous. Thus, it makes it possible to (imperfectly) solve the problem of finding instruments (in case of endogeneity of certain exogenous variables).

There are two dynamic GMM estimators: the first difference GMMs developed by Arellano and Bond (1991) and the system GMM (Arellano and Bover., 1995; Blundell and Bond., 1998). However, the literature has identified a problem related to the use of GMMs in first difference: in some cases, series lags are not reliable instruments (Bond et al., 2001). As a result, the GMM estimator in the system seems better than the first difference one. We will

therefore use this estimator in our empirical analyzes. However, to ensure the validity of the instruments used, we perform two complementary tests: the over-identification restriction test and series correlation test.

4- RESULTS AND DISCUSSION

We performed unit root tests on these series. Indeed, the stationarity of the series is essential for the estimation of a stable relationship between several economic series. We have thus performed the second-generation stationarity tests. The advantage of these tests is that they consider the heterogeneities that can exist between individuals. The test that we carried out in particular is the test of Pesaran (2003). The next table present the results of the unit roots tests.

Table 2: unit root test results

Variables	Ranks of integration
$LogY_{it} - LogY_{st}$	I(0)
Openness	I(0)
Investment (% of the GDP)	I(0)
HIV prevalence	I(0)
Government expenditures (% of the GDP)	I(0)

Source: Authors with data from the World Bank

Now, let us discuss the catch-up process in the SADC. The next table recapitulates our estimations of the β-convergence models in the SADC. Model one represents the estimation of the equation 3 while model 2 is the estimation of the equation 4. From our estimations, there is no proof of a real convergence in the SADC on the period considered. In fact, beta is positive and significant. This result could be explained if we consider the impact of the monetary union on the catch-up process.

A major result is that the Rand zone is a force of divergence in the region. Countries of this monetary union seem to converge faster than the others. This could confirm our prediction about the existence of two convergence clubs in the SADC. Te Velde (2011) obtained a similar result and showed that only the Rand zone economies converge in the Southern Africa region. Opara (2009) also shows that there isn't any proof of real convergence in the SADC in the same period.

Table 3: Coefficient of convergence

VARIABLES	(1) Model 1	(2) Model 2
Beta	0.861***	0.569***
	(0.0345)	(0.0410)
FDI/GDP	-0.115***	-0.0142***
	(0.00250)	(0.00235)
HIV prevalence	-0.0141***	-0.0424***
	(0.00416)	(0.00493)
Gouv/GDP	0.00823**	0.00909**
	(0.00383)	(0.00360)
I/GDP	- -8.30e-12	-9.27e-12
	(4.17e-11)	(3.91e-11)
MU		0.443***
		(0.119)
Open	0.000564	-0.000679
	(0.000798)	(0.000820)
Constant	8.572***	7.942***
	(0.127)	(0.120)
Observations	245	245
Number of Countries	10	10

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: Authors with data from the World Bank

The coefficient of convergence is positive and significant. This shows that considered countries do not yet converge. Concerning the other variables, we founded that the FDI, the Government expenditures and the human capital positively affect the convergence path in the region. Those variables are generally used to explain the long run growth path. So, it is not very unusual that they also explain real convergence.

Concerning particularly the rate of HIV prevalence, we should notice that AIDS is a drama in this region. Some countries have very high rates of prevalence. Those high rates are very harmful to the growth. But since the years 2000, local authorities have put in place regional policies to tackle this pandemic disease. This could explain the reduction of the disease. Also, local authorities have invested a lot of money in the fight against this disease.

Some studies showed that the creation of the SADC permitted to attract more FDI in the region (Opara, 2009). It is also admitted that the FDI could stimulate the economic growth. Hence, our result is not a surprise. Since the region attracts more FDI, those investment inflows could favour economic convergence.

We obtain a very unusual result. In fact, openness does not favour economic convergence in the considered region. This result is not a great surprise since the level of intra-regional trade is not very high. Furthermore, this intra-regional trade concerns essentially South Africa. In the other countries, we seem to have trade diversion.

Robustness test

To test the robustness of our results, we divide our period into three sub-periods. The first one goes from 1995 to 2000. The second runs from 2001 to 2005 and the last goes from 2006 to 2019. We estimate the equation 4 each of those periods. The table below presents the results of the estimations.

Table 4: Real convergence in the SADC

	(1)	(2)	(3)
VARIABLES	1995-2000	2000-2005	2006-2019
Beta	0.790***	0.966***	0.289***
	(0.0857)	(0.106)	(0.0101)
FDI/GDP	-0.00657*	-0.0127**	-0.0421
	(0.00380)	(0.00509)	(0.00888)
HIV prevalence	-0.0207*	0.00333	-0.921***
	(0.0109)	(0.0142)	(0.0172)
Gouv/GDP	0.0148**	0.00963	0.0116
	(0.00747)	(0.00726)	(0.00902)
I/GDP	0.00387	-4.94e-12	-4.19e-12
	(0.00499)	(4.83e-11)	(3.65e-11)
MU	0.273	0.0332	2.035***
	(0.253)	(0.313)	(0.428)
Openness	-3.34e-05	0.000347	-0.00221
	(0.00212)	(0.00217)	(0.00187)
Constant	3.289***	2.216***	4.321***
	(0.323)	(0.337)	(0.342)
Observations	50	50	150
Number of countries	10	10	10

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: Authors with data from the World Bank

Globally, our results are stable. In any of those periods, there is no proof of real convergence in the SADC. The results are just a bit different: the impact of the monetary union is only perceivable after 2005. Before that date, the monetary union had no impact on the real convergence in the region. After 2005, the countries of that union started to catch-up faster than the others. The same result is seen for the impact of HIV; after 2005, the policies put in place by the authorities to fight against HIV started to have a beneficial impact on the human capital quality in the region.

5- Conclusion

The main aim of this paper was to capture the impact of regional integration between developing countries on the real convergence process within a considered region. Taking the case of the SADC, we studied the economic implications of the entrance of South Africa in this free trade area. Economic theory claims that the integration of developing countries can be a powerful drive of real divergence. The empirical analysis is based on the estimation of a β-convergence model on all the SADC countries between 1995 and 2010. We estimate this model by the GMM dynamic model. Gains and looses tied to the creation of this economic grouping are unequally shared among member states. Globally, the results show that the SADC diverge. Nevertheless, an important result of this study was that the Rand zone is favourable to economic convergence for its member states. But, for the other countries of the SADC, this monetary union is a factor of divergence. Concerning the other variables, we founded that the FDI, the Government expenditures and the human capital positively affect the convergence path in the region. To hasten the convergence process, we propose the extension the Rand zone to the others countries of the region or the creation a new monetary union for all Southern African countries.

Reference

Akanni-Honvo, A. and Léon. (1995). « La croissance endogène régionalisée », Revue du Tiers Monde, tome XXXIX, n°155, juillet-Septembre.

Akanni-Honvo, A (2003). « Intégration régionale, effets frontières et convergence ou divergence des économies en développement », Région et Développement n°17.

Arellano, M. and **Bond, S. (1991)**. "Some tests of Specification for panel data: Monte Carlo evidence and an application to employment equation". Review of Economic Studies, vol 58, pp277-297.

Aryeety, E and Oduro, A. (1996), "Regional Integration Efforts in Africa: an Overview"; in ***J.J.Teunissen (ed.),*** *Regionalism and the Global Economy: The Case of Africa.* La Haye: Forum sur la dette et le développement.

Baldwin, R. (1989). "The growth effects of 1992", Economic Policy 9: 247-81

Barro and Sala-I-Martin (1992)." Covergence".Journal of Political Economy, Vol 100, N°2.

Beitone (2010), Dictionnaire de science économique, 3eédition , Armand Colin.

Blomstrom, M. and Kokko, A. (1997). "Regional Integration and Foreign Direct Investment: A conceptual framework and three cases". Policy Research Working paper N°1750 World Bank.

Cadot, O, De Melo, J and Olarreaga, M. (2000). « L'intégration régionale en Afrique : Où en sommes-nous? ». Revue d'Economie du Développement, no.1-2. pp. 247-261

De Melo, J. and Tsikata, Y. (2014). « Regional integration in Africa: challenges and prospective », Working paper, World Institute for Development Economics Research

De Melo, J., Carrère, J-F and **Guillaumont,. (2005). «** Has Distance Died? Evidence from a panel gravity model". World Bank Economic Review, vol. 1, 99-120.

Gbetnkom, D (2007). "A panel assessment of real convergence in CEMAC", American Review of Political Economy, January , vol 4, Number ½

Gbetnkom, D (2008). "Is south-south regionalism always a diversion: empirical evidence from CEMAC". International Trade Journal, Vol. 22, No. 1, Spring 08. February.

Gbetnkom, D (2013) ; « régionalisme, croissance économique et convergence : un examen des canaux théoriques », présenté au colloque sur l'intégration régionale-dimensions financière et commerciale, Casablanca.

Grandes, M (2003). "Macroeconomic convergence in southern Africa: the Rand zone experience", Working paper, no. 231, OECD Development Centre.

Henner, H-F (2001). « Convergence et divergence au sein d'une integration économique ». Papier présenté au Premier Colloque International Georges W. Ngango, Yaounde, 26-28 Février.

O'Rourke, K(1999). "Economic Integration and convergence: an historical Perspective". Journal of Economic Integration, 14 (2), June, 133-168.

Rieber and **Thi Anh-Dao Tran (2004). «** Intégration régionale Sud-Sud et répartition intra zone des activités », Revue Economique, vol.55, no.1, Janvier, pp41-61.

Venables, J.A (2000). « Regional integration agreements: a force for convergence or divergence ? », Working paper, Annual Bank Conference on Development Economics, Paris

Venables, J.A (2003). "The winners and losers from regionalism integration agreement", working paper, LSE